

What Every Firefighter Needs to Know About FARS

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Have you ever heard of firefighter air replenishment systems (FARS)? If not, you're not alone.

In fact, a majority of fire chiefs, fire marshals, and firefighters in the United States either have minimal knowledge or are completely unaware of this technological advancement, even though FARS are in the 2015 Edition of the International Fire Code as Appendix "L."

Don't be surprised. Many of the technologies we take for granted today, like thermal imaging cameras, were unheard of in the fire service not so long ago. New technologies arise every day, and not many things have the staying power to go on to affect our day-to-day operations. Even the best new ideas take time to gain acceptance in our complicated industry.



1 Firefighters using the "Bottle Brigade" method to cache air bottles in a high-rise building. Each member normally carries two bottles, one in each hand. This is a slow, difficult process for all involved. Because of firefighter fatigue, each member can only do one or two trips up stairways to higher floors before needing time in rehab. (Photos courtesy of Rescue Air Systems.)

FARS are now at that point. More and more jurisdictions are requiring FARS in midrise and high-rise buildings, large "big box" structures, and other new construction projects. Thousands of firefighters are becoming familiar with both the concept and the benefits of these systems. More than 400 FARS have been installed and are in service across the country, and there are 35 more currently in various stages of installation. FARS have been adopted in numerous states, including Arizona, California, Delaware, Florida, Nevada, Oregon, and Washington. As awareness grows, more and more jurisdictions are investigating and embracing the technology.

Even if you are part of a jurisdiction that has not adopted FARS yet, it is still advisable to get informed about what it is, how the system operates, and the benefits offered. Why? First, from a firefighter safety perspective, it may be possible that you could find yourself in a mutual aid, urban search and rescue (USAR), or other situation and be engaged in fire suppression in a building that has built-in air replenishment. Second, if and when your community is considering adopting FARS as part of its local fire code, your opinion should be an important part of this conversation. After all, it is your safety at stake.

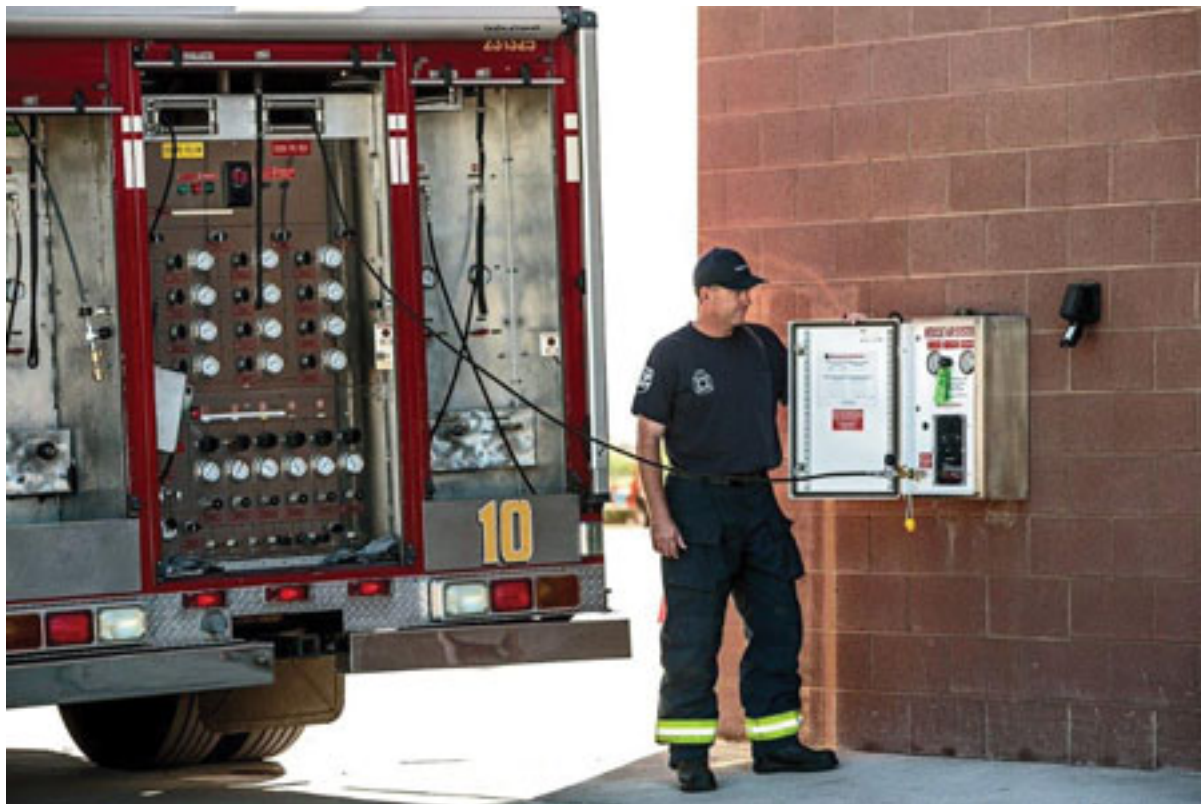
First, What Are FARS?

Simply stated, FARS are standpipes delivering breathing air, providing firefighters with a quick, safe, and effective means to refill their air bottles at filling stations located throughout a building during emergency operations. FARS deliver air replenishment when and where firefighters need it the most.

To effectively execute their mission of extinguishing fires, firefighters normally need two important resources: water and breathing air. Under current firefighting standard operations, by the time a firefighter is prepared to enter an immediately dangerous to life or health (IDLH) environment, he will be wearing or carrying close to 100 pounds of gear, including a self-contained breathing apparatus (SCBA) with one 30-minute-rated bottle, providing approximately 15 minutes of operation, and no water.

Water, which is heavy and cumbersome to transport, can be brought to emergency scenes through hoses, tanker trucks, building fire protection systems like standpipes, and apparatus water tanks. In high-rises and other large, complex buildings, combination standpipes are required that can provide water to every level of a building at end-user pressures. But, it wasn't always like this. We've all seen vintage images of the bucket brigades that were once used to put water on fires, which seem laughable now. But, we need to remember that, at the time, this was the state of the art for firefighting.

For decades now, we've used the current, modern delivery systems to provide water when and where it is needed. Modern combination standpipes include pressure-regulation technology as well as fire pumps to maintain the pressures necessary, regardless of the location of the emergency, and obviating the need for firefighters to bring their own water with them when they enter IDLH environments.



2 Mobile Air Units that are stationed at the EMAC connect to the FARS and pressurize it.

Air, the second important resource that firefighters need to operate, is a different story. Firefighters still need to bring their own breathing air to fire scenes. As stated above, this normally involves SCBA with one 30-minute-rated bottle each. The reality we have all come to know is that 30-minute air bottles actually provide a much shorter supply of breathing air. A large firefighter, working hard in an emergency situation, can easily deplete an air bottle in 10 to 12 minutes, after which he will either need to evacuate the area or get a replacement bottle. Every experienced firefighter knows, within a minute or two, how long his air bottle will last. Fire departments that respond to high-rise buildings normally have tactical plans that include moving a large quantity of air bottles to forward staging areas nearby. Depending on the number of firefighters available, one, two, or even more fire companies are assigned to carry spare bottles up and down the stairs or to and from firefighter-access elevators to the staging area, normally located within two floors of the emergency.

After-action reports of large-scale high-rise fire operations show that dozens or even hundreds of spare air bottles are needed to support these fire suppression operations. In one prominent example, the Los Angeles (CA) Fire Department used more than 600 air bottles during the First Interstate Bank Building Fire. This fire is especially noteworthy because it was the first time a high-rise building with more than one floor fully engaged in fire was extinguished by the fire department without losing the rest of the building. Thankfully, high-rise fires like this are rare occurrences. However high rise buildings are becoming more and more common and are even found in relatively small cities and towns with correspondingly small fire departments.

It needs to be stated in the clearest and most unequivocal language possible: A high-rise fire is a *big deal*, wherever and whenever it occurs, and only a well-staffed, well-equipped, and well-trained fire department can rise to this particular challenge. Incident commanders (ICs) and firefighters need to be aware of the huge logistical task they will be forced to undertake if they experience a working fire in a high-rise. Under current conditions, a cadre of firefighters will spend the entire incident simply ferrying air bottles up and down the stairs. Along with their personal protective equipment (PPE), each firefighter can only safely carry two spare bottles (one in each hand). Once they reach the designated floor

of the building, they must drop off the bottles and then take two empty ones down for refilling. It is important to note that only large, well-staffed fire departments would have the ability to have such a large number of firefighters removed from firefighting duty, restricting their efforts just to maintaining air resources.

I was first introduced to FARS in 2003, when I was serving as chief of the San Francisco (CA) Fire Department. I was convinced of the benefits and began the process of adding FARS to the city and county fire codes, which was finalized after I left the department in 2004. I remain convinced today, which is why I've agreed to help get the word out to the fire service.

Buildings equipped with FARS have breathing air available every few floors, allowing at least two bottles to be refilled at each fill station in two minutes or less. Imagine if access to breathing air was as readily available as water from the standpipe connections in each stairway. This is not new technology or a "wish list" item-the technology has been available for more than a decade and is widely in use today.

How Do FARS Work?

During the construction process, FARS installers pull seamless stainless steel tubing up through stairway shafts, protected by two-hour fire enclosures. Depending on the option chosen by the local authority having jurisdiction, air-filling stations are located at various locations in designated stairways or air resource closets (every three floors is a common requirement).

The panels can be simple high-pressure hoses or rupture-protection enclosures, each of which can fill two air bottles in two minutes or less. Initially, the breathing air comes from large "H" bottles located in the air resource room, normally at the ground floor of the building.



3 An air-filling station with four air hoses, each of which will fill an empty bottle in two minutes or less.

ICs can assign a small cadre of firefighters (one or two) to fill air bottles at designated floors or areas, without having to transport or cache a large number of air bottles to the fire floor. The air available will easily refill bottles until a mobile air unit (MAU) can arrive at the location, where it will hook up to the FARS at the external mobile air connection panel (EMAC) and pressurize it. EMACs are located remotely from the building entrance, ensuring that the air is free from smoke or other contaminants and safe from falling glass.

FARS are normally installed in mid-rises, high-rises, tunnels, ships, large "big box" style structures, underground structures, and so-called mega buildings. FARS can be indicated whenever the closest point of ingress or egress is farther than a firefighter can walk using one 30-minute air bottle.

Questions, Rumors, and Myths

Predictably, now that FARS are available, and many fire service members have had a chance to evaluate their usability, some questions, rumors, and myths have developed.

How do I know that I can trust the air from a FARS, and how do I know it isn't contaminated? The answer to that is easy. Every authorized FARS is monitored on a 24-hour-per-day basis for carbon monoxide, air pressure, and moisture. In the highly unlikely event that some sort of contamination develops or the pressure drops below the required level, audible and visible alerts are triggered. Building maintenance will address any issues well before any

emergency occurs. During emergency operations, ICs and responders can easily check the meters at every connection panel and ensure that the air is clean and safe. Once the MAU connects to and pressurizes the system, the air that firefighters get from the system is the same air they would get if the bottle was walked down to the MAU and filled, as is the case in nonFARS buildings.

Where does the air in a FARS come from? Every FARS uses air from large, commercial air bottles found in the air supply room of the building. This air keeps the system pressurized constantly, making the air immediately available to first responders. The air is delivered to each bottle-filling panel through continuous (not welded) and seamless stainless steel tubing, like medical gas systems found in hospitals and medical clinics. As the incident unfolds, MAUs connect to the system and pump air into it, just like a pumper truck pressurizes standpipes and sprinkler systems. This is the same air that firefighters use under current operating procedures, so we know it can be trusted.

With tight budgets and budget cuts, our fire department can't afford systems like FARS. Actually, FARS don't impact fire department budgets at all. When a system is required by the local fire code, the building owner/operator pays for installation and maintenance, just like other fire protection equipment such as sprinklers and fire alarms. The only cost to the department will be for the provision of necessary training on how to use the system, which is very simple and fast.



4 Two firefighters using a FARS to recharge air bottles without uncovering their SCBA face pieces. Two air bottles can be filled in two minutes or less at every bottle-filling station throughout the building.

According to developers and building owners, FARS is too expensive and cost-prohibitive and could kill development in our community. This is a false statement and easily debunked. Historically, the cost of a FARS is only about ½ of one percent of the construction cost, which is easily affordable and should not hinder new construction efforts.

Systems like FARS are too technical and complicated and not user-friendly to firefighters. A FARS is simply an extension of our current technologies and is very simple to operate. Even without training, any firefighter who can disconnect an air bottle and exchange it can easily use a FARS to fill bottles. Under emergency conditions, firefighters can even fill their air bottles right on their backs without removing their face pieces and have a completely full air bottle in less than two minutes. FARS will work with any SCBA available today, with no adapters or technical knowledge necessary. There is no reason to be afraid of it as a new technology. Rather, it is just another way to fill air bottles using current fittings and technology.

There is only one provider of FARS, meaning one company has a monopoly and we would have to use “sole source” language to adopt it. This is another false statement. Several companies build and install FARS. One company does hold patents for certain technological components, but this does not preclude other providers from doing business. Like every other piece of technology we have used in the past, there were pioneers who either developed them or perfected them for use in the fire service. We know that, initially, only one company installed fire sprinklers. Now, many qualified companies and manufacturers do so. Likewise, once only one company manufactured SCBA for the fire service. Now there are many different manufacturers from which fire departments can choose. There is no reason to believe that FARS will be any different as they become more common in our industry.

Now that we've become reliant on these technologies, it's difficult to imagine fighting fires without them. I believe FARS will become indispensable tools in modern firefighting. Unfortunately, some fire service members not only don't support FARS, they argue vigorously against them using some of the misconceptions addressed above. Of course, everyone is entitled to an opinion, and there are always people who argue against new technologies. At one time, there were those who argued against SCBA, sprinklers, Nomex PPE, protective hoods, and virtually every other new addition to our arsenal of equipment. Speaking personally, and particularly as a line-of-duty cancer survivor, I strongly support FARS as firefighter safety items. They fall in line with the advice I always give to those still on the front lines of the fire service: When it comes to SCBA, cover sooner and stay covered longer!

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